FIG. 1

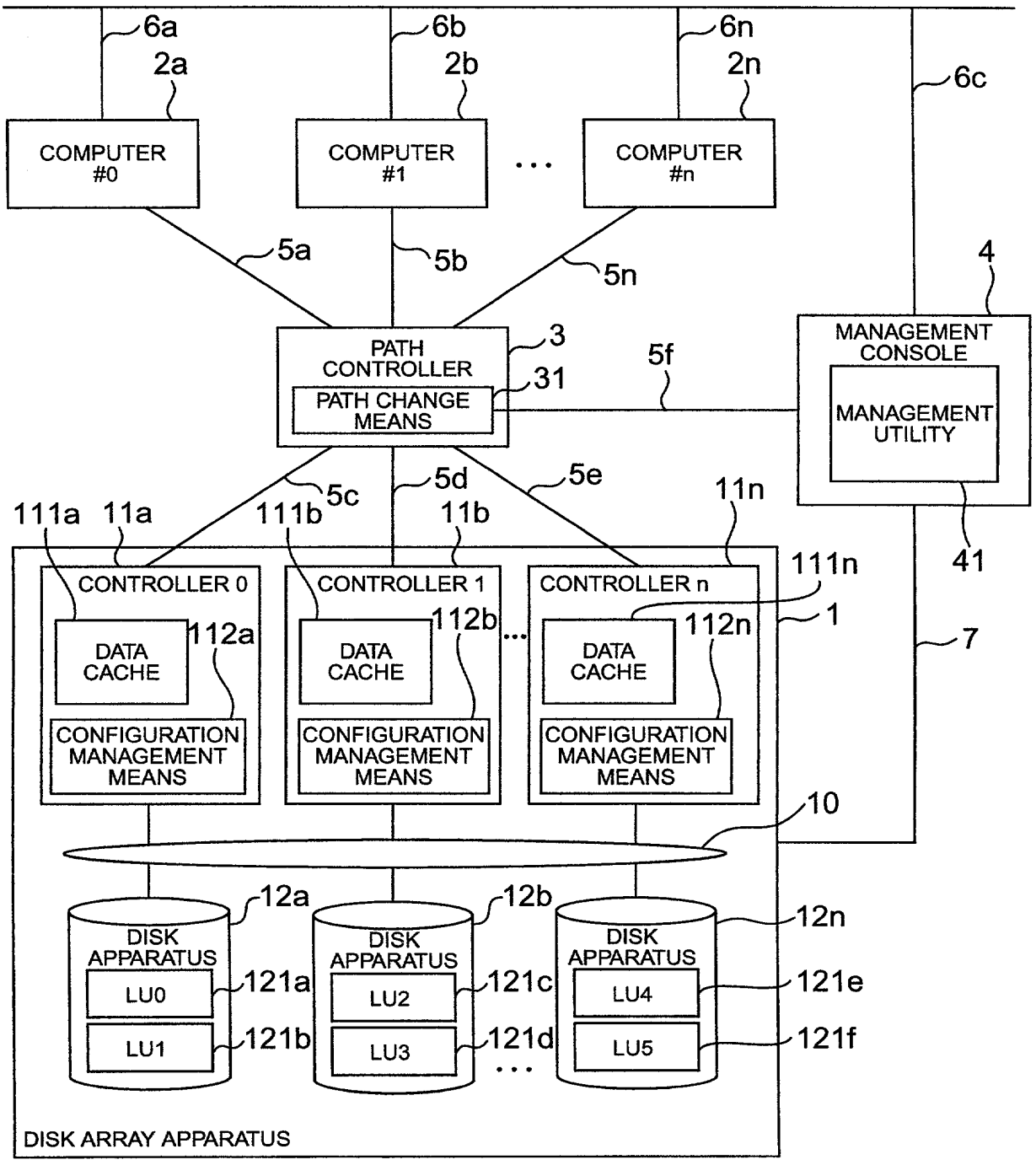
6a
2a
6b
2b
6n
2n
6c
COMPUTER #0
COMPUTER #1
COMPUTER #n
5a
5b
5n
4
PATH CONTROLLER
3
PATH CHANGE MEANS
31
5f
MANAGEMENT CONSOLE
MANAGEMENT UTILITY
41
5c
5d
5e
111a
11a
111b
11b
11n
111n
CONTROLLER 0
CONTROLLER 1
CONTROLLER n
1
DATA CACHE
112a
112b
112n
CONFIGURATION MANAGEMENT MEANS
7
10
12a
12b
12n
DISK APPARATUS
LU0
LU1
LU2
LU3
LU4
LU5
121a
121b
121c
121d
121e
121f
DISK ARRAY APPARATUS

FIG. 2

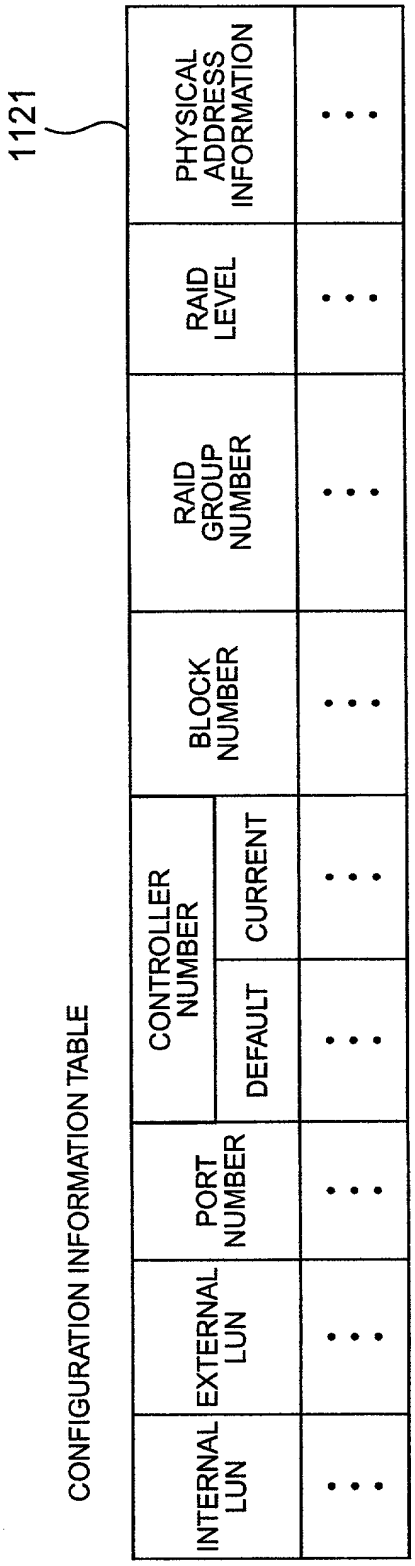
1121
CONFIGURATION INFORMATION TABLE
INTERNAL LUN
EXTERNAL LUN
PORT NUMBER
CONTROLLER NUMBER
DEFAULT
CURRENT
BLOCK NUMBER
RAID GROUP NUMBER
RAID LEVEL
PHYSICAL ADDRESS INFORMATION

FIG. 3

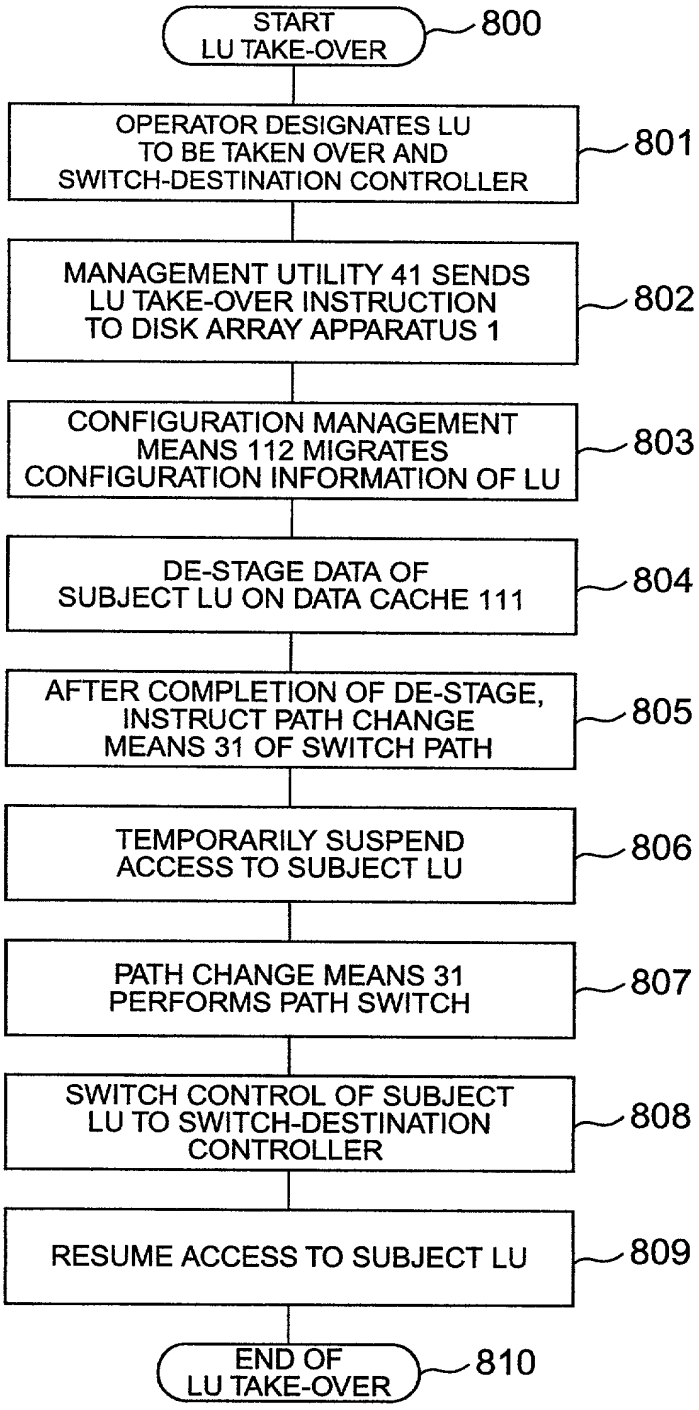
START LU TAKE-OVER
800
OPERATOR DESIGNATES LU TO BE TAKEN OVER AND SWITCH-DESTINATION CONTROLLER
801
MANAGEMENT UTILITY 41 SENDS LU TAKE-OVER INSTRUCTION TO DISK ARRAY APPARATUS 1
802
CONFIGURATION MANAGEMENT MEANS 112 MIGRATES CONFIGURATION INFORMATION OF LU
803
DE-STAGE DATA OF SUBJECT LU ON DATA CACHE 111
804
AFTER COMPLETION OF DE-STAGE, INSTRUCT PATH CHANGE MEANS 31 OF SWITCH PATH
805
TEMPORARILY SUSPEND ACCESS TO SUBJECT LU
806
PATH CHANGE MEANS 31 PERFORMS PATH SWITCH
807
SWITCH CONTROL OF SUBJECT LU TO SWITCH-DESTINATION CONTROLLER
808
RESUME ACCESS TO SUBJECT LU
809
END OF LU TAKE-OVER
810

FIG. 4A

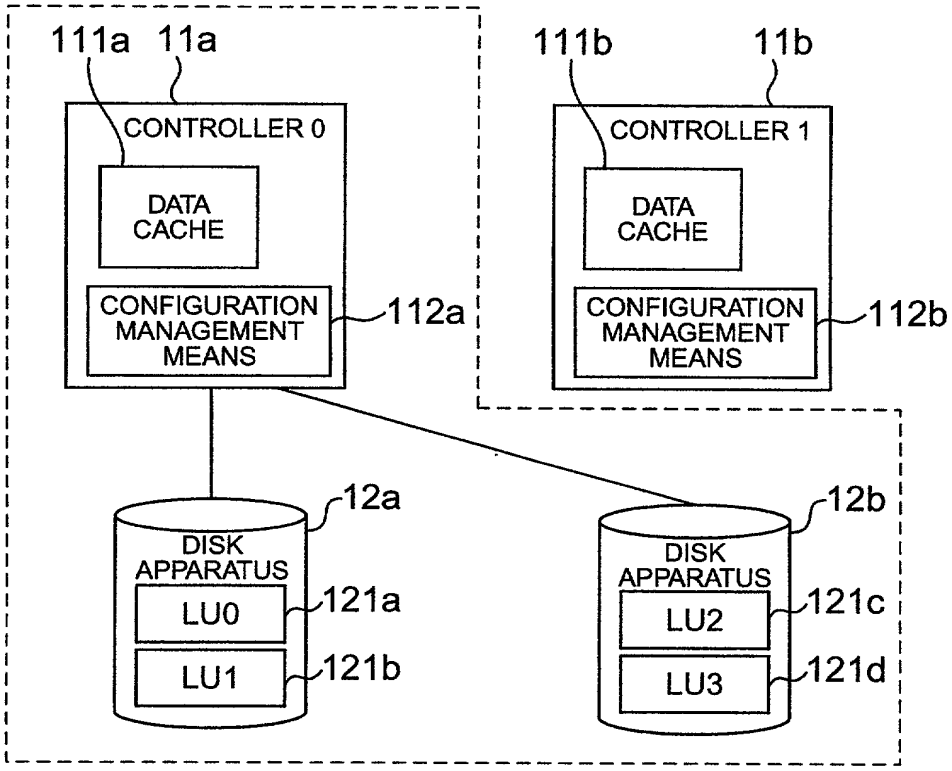
111a
11a
CONTROLLER 0
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112a
111b
11b
CONTROLLER 1
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112b
12a
DISK APPARATUS
LU0
121a
LU1
121b
12b
DISK APPARATUS
LU2
121c
LU3
121d

FIG. 4B

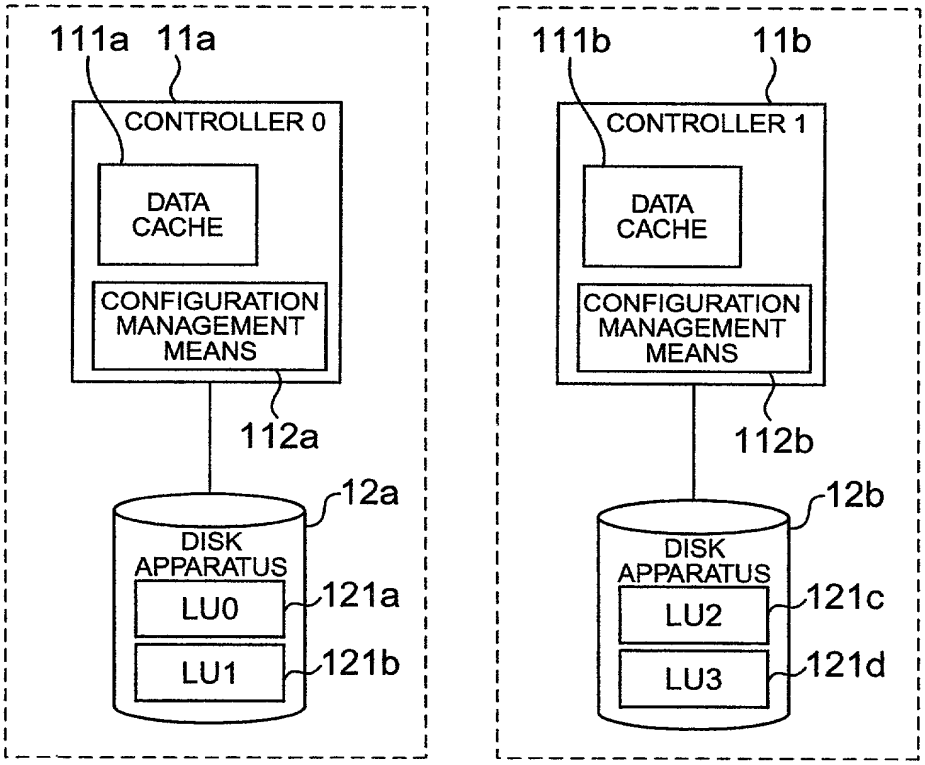
111a
11a
CONTROLLER 0
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112a
111b
11b
CONTROLLER 1
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112b
12a
DISK APPARATUS
LU0
121a
LU1
121b
12b
DISK APPARATUS
LU2
121c
LU3
121d

FIG. 5A

CONFIGURATION TABLE BEFORE TAKE-OVER

1121 ×

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	1	0	0	0	⋮	⋮	⋮	⋮
1	3	0	0	0	⋮	⋮	⋮	⋮
2	0	1	0	0	⋮	⋮	⋮	⋮
3	2	1	0	0	⋮	⋮	⋮	⋮

FIG. 5B

CONFIGURATION TABLE AFTER TAKE-OVER

1121 ×

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	1	0	0	0	⋮	⋮	⋮	⋮
1	3	0	0	0	⋮	⋮	⋮	⋮
2	0	0	1	1	⋮	⋮	⋮	⋮
3	2	0	1	1	⋮	⋮	⋮	⋮

FIG. 6

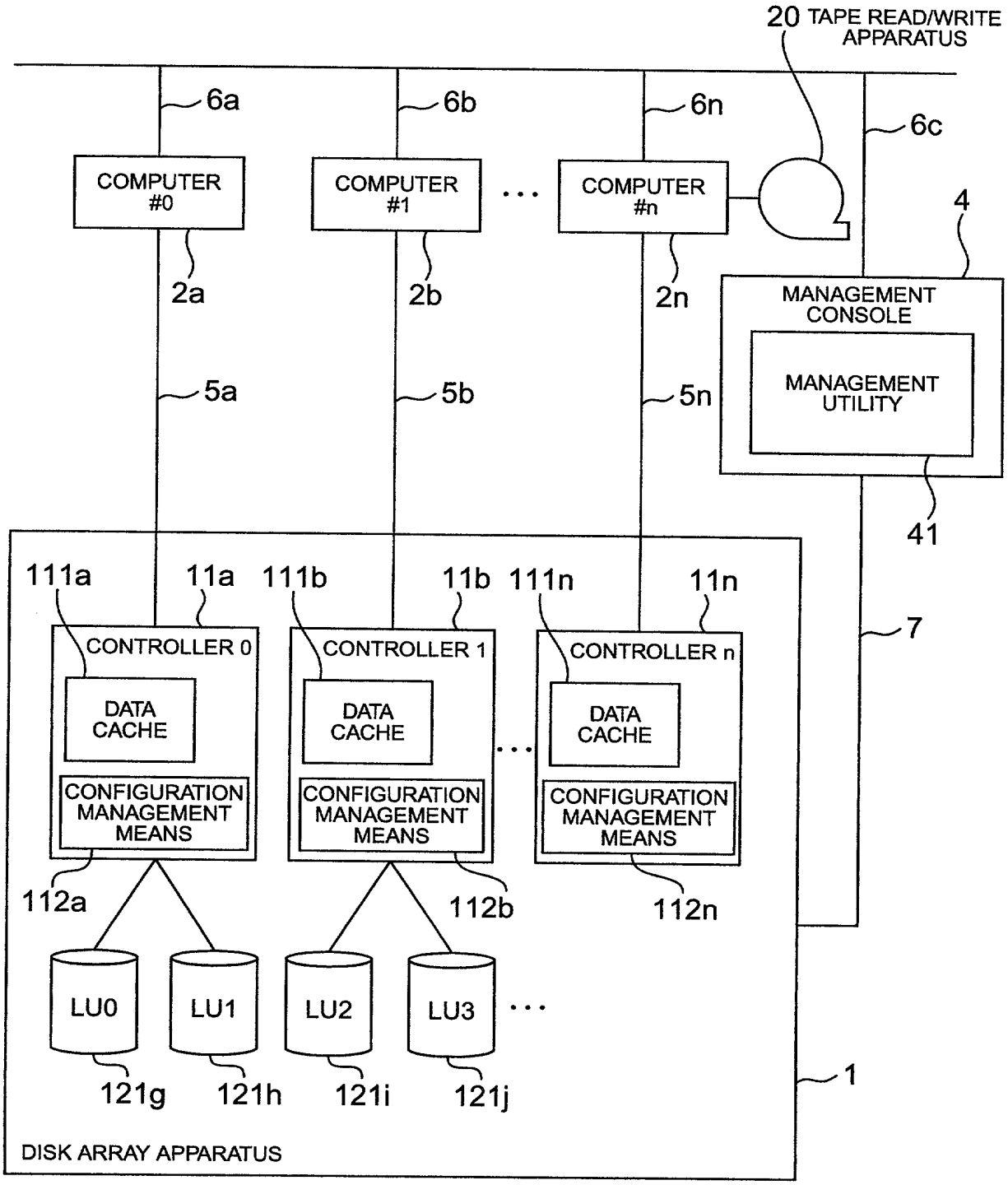
20 TAPE READ/WRITE APPARATUS
6a
6b
6n
6c
COMPUTER #0
COMPUTER #1
COMPUTER #n
4
2a
2b
2n
MANAGEMENT CONSOLE
MANAGEMENT UTILITY
5a
5b
5n
41
111a
11a
111b
11b
111n
11n
7
CONTROLLER 0
CONTROLLER 1
CONTROLLER n
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112a
112b
112n
LU0
LU1
LU2
LU3
121g
121h
121i
121j
1
DISK ARRAY APPARATUS

FIG. 7

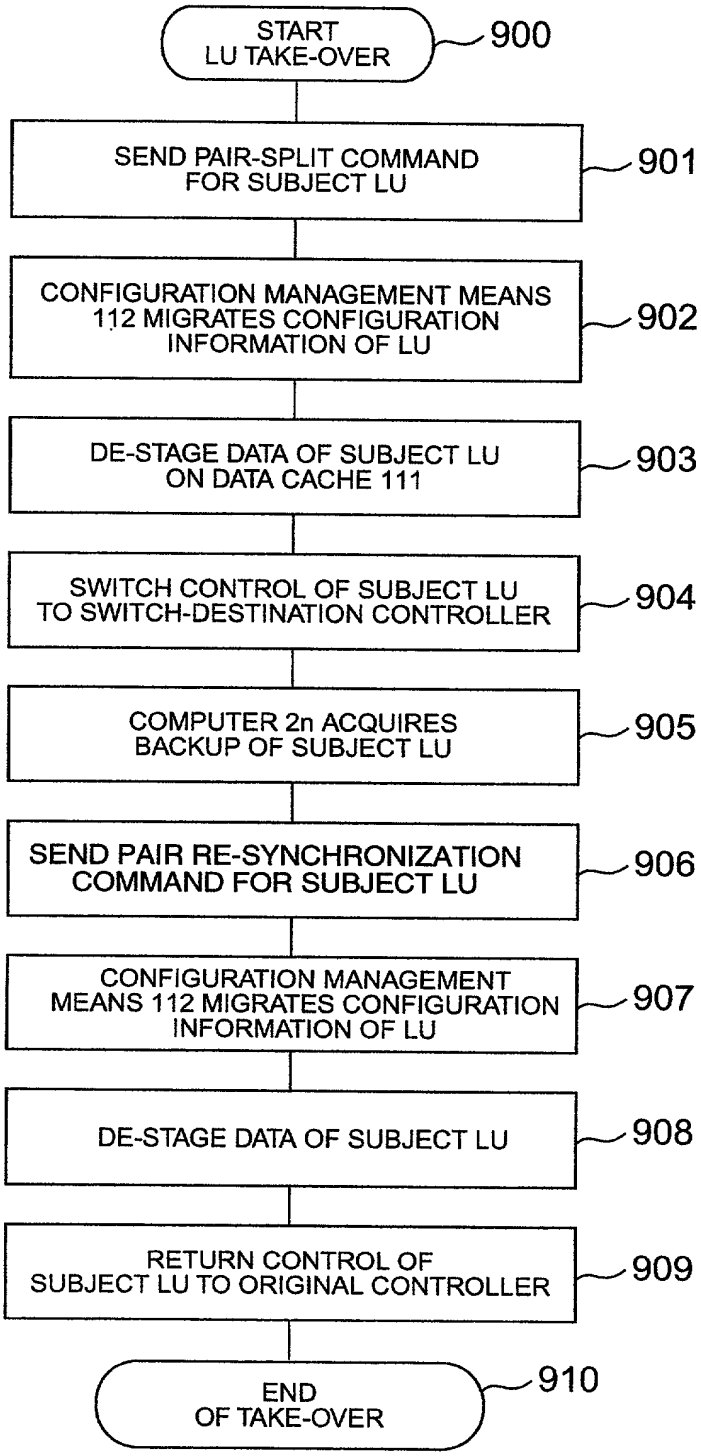
START
LU TAKE-OVER
900
SEND PAIR-SPLIT COMMAND
FOR SUBJECT LU
901
CONFIGURATION MANAGEMENT MEANS
112 MIGRATES CONFIGURATION
INFORMATION OF LU
902
DE-STAGE DATA OF SUBJECT LU
ON DATA CACHE 111
903
SWITCH CONTROL OF SUBJECT LU
TO SWITCH-DESTINATION CONTROLLER
904
COMPUTER 2n ACQUIRES
BACKUP OF SUBJECT LU
905
SEND PAIR RE-SYNCHRONIZATION
COMMAND FOR SUBJECT LU
906
CONFIGURATION MANAGEMENT
MEANS 112 MIGRATES CONFIGURATION
INFORMATION OF LU
907
DE-STAGE DATA OF SUBJECT LU
908
RETURN CONTROL OF
SUBJECT LU TO ORIGINAL CONTROLLER
909
END
OF TAKE-OVER
910

FIG. 8A

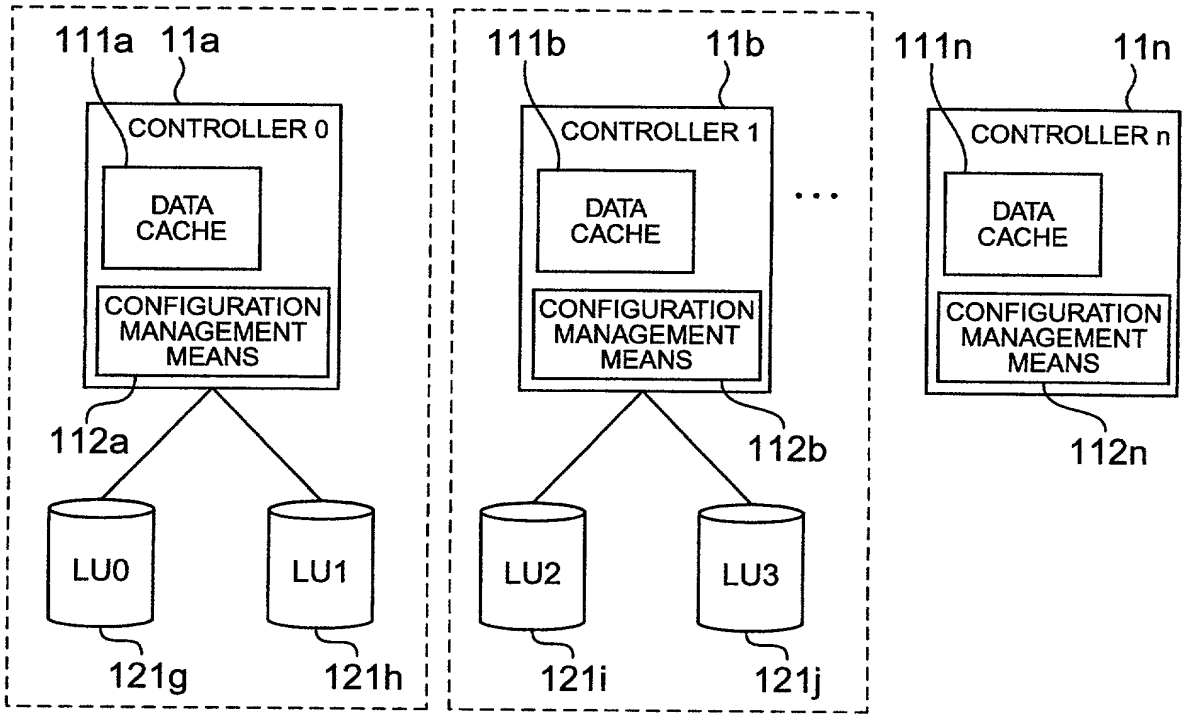
111a
11a
CONTROLLER 0
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112a
LU0
LU1
121g
121h
111b
11b
CONTROLLER 1
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112b
LU2
LU3
121i
121j
111n
11n
CONTROLLER n
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112n

FIG. 8B

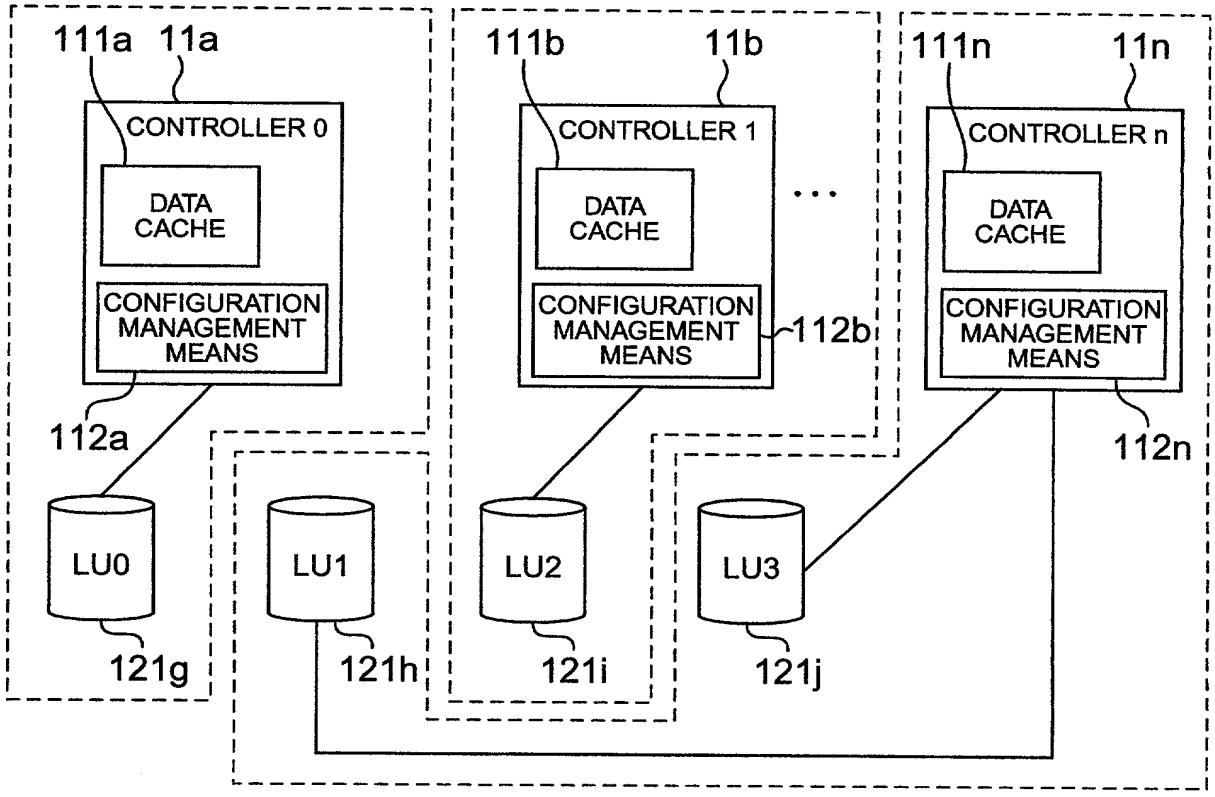
111a
11a
CONTROLLER 0
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112a
LU0
LU1
121g
121h
111b
11b
CONTROLLER 1
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112b
LU2
LU3
121i
121j
111n
11n
CONTROLLER n
DATA CACHE
CONFIGURATION MANAGEMENT MEANS
112n

FIG. 9A

CONFIGURATION TABLE BEFORE TAKE-OVER

1121 ×

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	0	0	0	0	⋮	⋮	⋮	⋮
1	1	0	N	0	⋮	⋮	⋮	⋮
2	1	0	1	1	⋮	⋮	⋮	⋮
3	2	0	N	1	⋮	⋮	⋮	⋮

FIG. 9B

CONFIGURATION TABLE AFTER TAKE-OVER

1121 ×

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	0	0	0	0	⋮	⋮	⋮	⋮
1	1	0	0	N	⋮	⋮	⋮	⋮
2	1	0	1	1	⋮	⋮	⋮	⋮
3	2	0	1	N	⋮	⋮	⋮	⋮
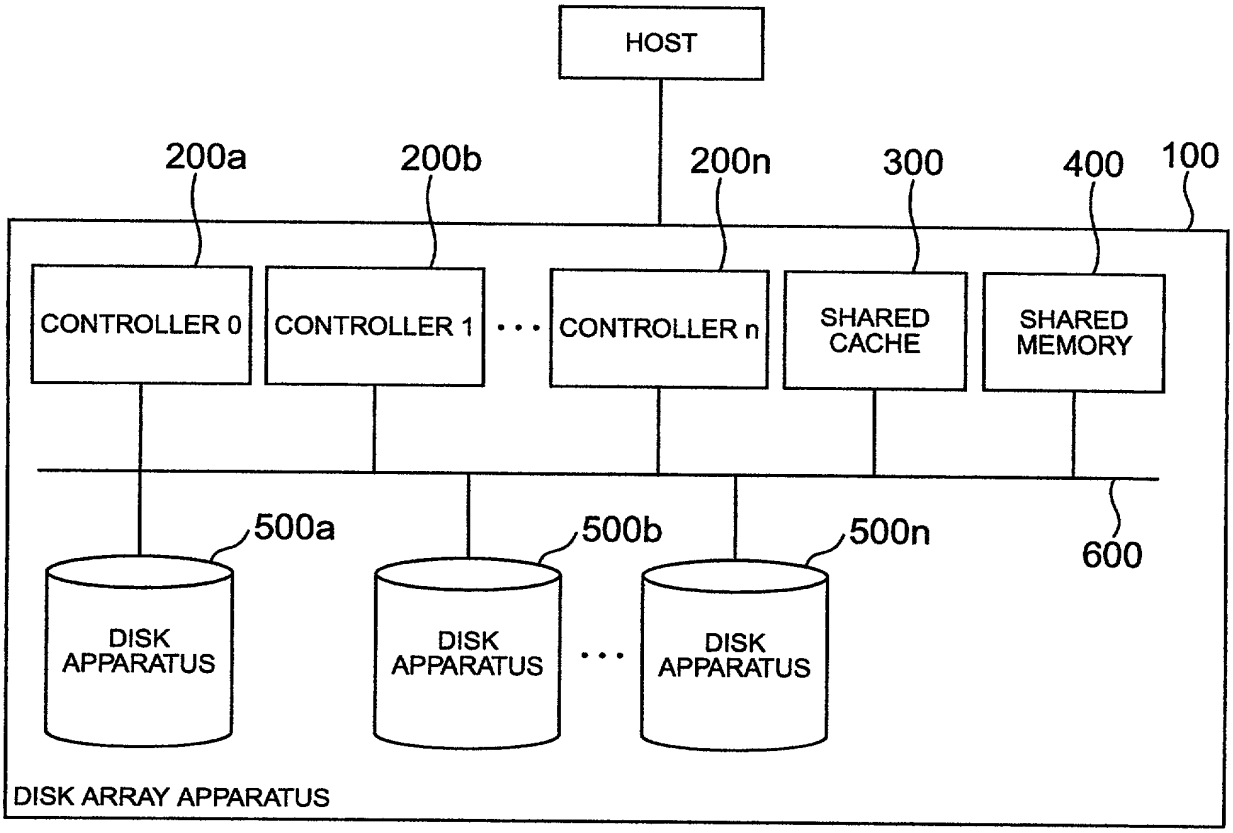
FIG. 10
PRIOR ART